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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/623,495

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Takeo Kawase

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11/16/2005

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EXAMINER

DOLAN, JENNIFER M

ART UNIT

PAPER NUMBER

2813

DATE MAILED: 11/16/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

AK

Office Action Summary	Application No. 10/623,495	Applicant(s) KAWASE, TAKEO	
	Examiner Jennifer M. Dolan	Art Unit 2813	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 September 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 38,39,45-51,59,60,62,63,65,66 and 68-79 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 38,39,45-51,59,60,62,63,65,66 and 68-79 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 9/1/05 has been entered.

Allowable Subject Matter

The indicated allowability of claims 59, 62, 65, and 68 is withdrawn in view of the newly discovered reference to Heilmeier. Rejections based on the newly cited reference follow.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 38, 39, 45-51, 70, and 73-79 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 51, the claim language shows improper antecedent basis. The claim recites "elongate indent regions" and "further elongate indent regions" in addition to an "indent region", thus suggesting that all of the elements are separate and distinct entities. The claim

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language, however, by stating that the indent region controls the spread of the liquid material, but that the liquid material is deposited on the surface between the elongate indent regions, indicates that the elongate indent regions of line 8, the 'further elongate indent regions' of line 10 must be the same entity as the indent region of line 2.

Claim 70 requires a plurality of indents formed in a substrate between a first liquid material and a second liquid material. It is unclear whether the applicant is simply claiming a single indent having a cross sectional profile that is being claimed as a series of indents (similar to the embodiment of figure 5d), or whether the applicant is claiming a series of distinct indents, each one perhaps including a cross sectional profile.

The specification and several dependent claims (45, 46, 73, 74) establish that the secondary barrier/cross sectional profile is considered to be a portion or a profile of the wider indent, rather than being considered a series of distinct indents (see first paragraph of page 10 of the Spec; figures 5d and 5e). Additionally, the language of the claims suggests that the indents are not the same as the cross sectional profile. For example, if the plurality of indents are taken alone as the secondary barrier, then claim 74 adds nothing to the claimed invention, and claim 45 contradicts itself, by stating that the wall portions are sloped, but castellated (which would be a non-sloped shape). Thus, a person skilled in the art would not be certain from the language of claim 70 whether the Applicant is claiming the embodiment of figure 5d, wherein a single indent having a cross sectional profile is provided between two liquid materials, or whether the liquids are separated by a plurality of distinct or individual indents, each one potentially including its own cross sectional profile structure acting as a secondary barrier, which is an embodiment

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completely unsupported by the specification, yet more consistent with the terminology of the specification and the terminology of the claims dependent upon claim 70.

For the purposes of examination, it is assumed that the depressions of a cross sectional profile of a single groove would be considered to be “a plurality of indents.”

Regarding claim 47, it is further unclear as to how the claimed first, second, and further elongate indent regions relate to the plurality of claimed indent regions having a cross sectional profile from claim 74 (i.e., it is unclear as to whether these claimed indents are part of the first plurality of indent regions between the first and second liquid materials, or whether they are a completely separate structure, unrelated to the structure in claim 70).

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 38, 39, 45, 47, 70, 71, and 73-78 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent Publication No. 2003/0235678 to Graham et al.

Regarding claims 70, 71, and 73, Graham discloses a patterning method comprising: depositing first and second liquid materials on a substrate (see paragraphs 0003, 0006, 0007, as

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Graham is drawn to forming images using individual droplets of different colors, then any two different or same colored droplets are considered to be the “first” and “second” liquid materials), and a plurality of indents on a substrate (see figures 1 and 4; where either the large indents or the small microstructure indents are considered to form the plurality of indents; see paragraphs 0012, 0015, 0036-0039; 0048-0051), the plurality of indents being formed between the first and second liquid materials (since each square shaped recess in figures 2 or 3 is a droplet receiving region, it is inherently the case that any two non-adjacent recesses would have a plurality of indents separating the liquids received in the two non-adjacent recesses. For example, a droplet received in the lower left side recess in figure 3 is separated from the droplet received in the upper left side recess by three large indents and a large plurality of small indents). Re: claims 71 and 73, Graham discloses that the indent has sloping sidewalls and a width tapering toward the bottom (paragraph 0039).

Regarding claims 74 and 45, Graham discloses that the indents have a castellated cross sectional profile acting as a secondary barrier to control spread of the liquid materials (figures 5 and 6, item 540; paragraphs 0048-0051).

Regarding claims 38 and 39, Graham discloses that the same colored droplets or different colored droplets may be disposed to form the image, thus acting as same and different liquid materials (see paragraphs 0003, 0006, 0007).

Regarding claims 47 and 76, Graham discloses that the plurality of indent regions can be elongate (paragraphs 0039-0041), have a substantially planar bottom surface (figure 1; secondary microstructure is very small, making it “substantially planar” with respect to the indent walls).

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Since Graham discloses a large number of spaced indents, Graham is considered to teach the spaced first, second, and further elongate indent regions.

Regarding claim 75, Graham discloses adjusting the wetting characteristic of a surface of the substrate relative to the liquid materials (paragraphs 0055-0058).

Regarding claims 77 and 78, Graham discloses forming the indents through stamping or molding (paragraphs 0071-0072).

6. Claims 59, 60, 62, 63, 65, 66, 68, and 69 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 3,600,061 to Heilmeier.

Regarding claims 59, 62, 65, and 68, Heilmeier discloses a patterning method for depositing a liquid (13) onto a surface of a substrate (figures 1-3), the method comprising: forming a first and second indent (14) in the surface (figures 1-3), each indent having falling edges coincident with the surface and spaced a distant apart (see figure 3), and in which forming the indents includes forming wall portions sloping relative to the surface (see figures 4-7); depositing the liquid between the indents (column 1, lines 70-75), and selecting the distance (since the grooves are deliberately formed in the substrate, it is inherently the case that the distance between the grooves is 'selected'). Since the liquid is confined to the area between the grooves by the surface tension of the liquid at the edges of the grooves (see column 1, lines 70-75), then a greater volume of liquid is retained, a greater contact angle is achieved, and a greater thickness is retained on the surface between the indents than in the case where one of the indents is missing and the liquid spreads across the substrate. Additionally, Heilmeier discloses that the liquid crystal layer may expand, such that the diameter of the retained liquid increases to a value

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greater than the claimed distance, and such that the liquid may flow into the grooves when the surface tension becomes too great to for the liquid to remain confined between the grooves (see column 2, lines 10-22).

Regarding claims 60, 63, 67, and 69, Heilmeier discloses using such a method to form a pattern (see figure 1; liquid crystal extent is a pattern) for an electronic device (column 1, lines 5-30 – a liquid crystal device is an electronic device).

7. Claims 38, 39, 70, 75, and 76 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 6,022,647 to Hirose et al.

Regarding claim 70, Hirose discloses a patterning method comprising: depositing a first liquid material (figure 1B – droplet material 4 at the left) and a second liquid material (droplet 4, either on the right-side or second from the right in figure 1B) on a substrate (layers 1 and 2 are considered to be the substrate), a plurality of indents formed in the substrate (regions between raised portions 2; also see column 3, lines 25-33), a plurality of indents being formed between the first and second liquid materials (see figures 1a-1d; 2 or 3 indents are disposed between the first and second liquids cited above).

Regarding claim 75, Hirose discloses adjusting the wetting characteristic of the substrate relative to the liquids (column 3, lines 15-25).

Regarding claim 76, Hirose discloses that the indents have a substantially planar bottom surface (see figure 1A).

Regarding claims 38 and 39, Hirose discloses that the ink materials 4 are red, green, and blue pigments (see column 1, lines 25-50), and thus any two selected droplets may comprise the same or a different pigment material.

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8. Claims 38, 48, 70, 75, and 76 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 6,696,225 to Kanbe et al.

Regarding claims 38 and 70, Kanbe discloses depositing first and second liquid materials (any two spaced apart droplets- see figures 3 and 4), the materials being the same, on a substrate (figure 3); a plurality of indents being formed in the substrate (regions between raised portions 11 – see figures 3 and 4), where a plurality of indents are formed between the first and second liquids (a plurality of indents are formed between any spaced apart droplets – for example, there are 3 indents between the second column droplet in L2 of figure 4 and the eighth column droplet in L2 of figure 4).

Regarding claim 75, Kanbe discloses adjusting the wetting characteristic of the surface of the substrate relative to the liquid materials (column 2, lines 25-55; column 4, lines 1-55).

Regarding claim 76, Kanbe discloses that the indents have a substantially planar bottom surface (see figure 3).

Regarding claim 48, Kanbe teaches manufacturing an electronic device by making a pattern (see columns 1 and 2).

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 46 and 72 are rejected under 35 U.S.C. 103(a) as being unpatentable over Graham et al.

Regarding claim 72, Graham discloses depositing a first liquid material (liquid ink material deposited in any of the square shaped recesses – hereforth a ‘first recess’ in figures 2, 3), depositing a second liquid material (liquid material deposited in any recess near the first recess – hereforth a ‘second recess’), an indent being formed between the first and second liquid materials (any recess generally formed between the first and second recesses). Graham further suggests that any geometric or random configuration may be used, and parameters such as the wall angle of the indent, may be optimized when shaping the walls of the indents (see paragraphs 0039-0041).

Graham does not specifically teach that the indent region widens toward the bottom.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to specify that the indent region microstructure of Graham may have wall angles such that the indent region widens near the bottom. The rationale is as follows: A person having ordinary skill in the art would have been motivated to provide indent regions widening toward the bottom, because Graham suggests that any geometric shape may be used, and that the wall angle can be altered and optimized for any specific application (see paragraphs 0039-0041). Since Graham further teaches that the indent region is used to prevent wicking/capillary action between the liquid in the indent region and the substrate (see paragraph 0015), and that the microstructure must have sufficient capacity to control the placement of a single drop of ink with no overflow of the ink (paragraphs 0038-0042), it would be reasonable for a person skilled in the

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art to optimize the wall angle and thus select an indent region widening at the bottom in order to decrease the degree of wicking as well as increase the volume capacity of the indent.

Regarding claim 46, Graham teaches that saw-tooth shapes are appropriate for the microstructure fluid barrier (paragraph 0039), and that a secondary barrier can be provided for enhanced control (paragraphs 0047-0049).

Graham fails to explicitly teach that the secondary barrier may have a saw-tooth shape.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the indent region of Graham, such that the secondary barrier has a saw-toothed profile. The rationale is as follows: A person having ordinary skill in the art would have been motivated to provide a saw-toothed profile, because Graham teaches that any geometric shape including vertical or angled walls can advantageously be used as an element to control microfluid placement (paragraphs 0038-0039). Since the secondary barrier structure serves a similar function as the primary structure, and since Graham only specifically teaches shapes appropriate for the primary structure, it is well within the purview of a person having ordinary skill in the art to deduce that the cited microstructure element shapes for controlling the placement of the fluid drops are appropriately used for both the primary and secondary microstructures (paragraphs 0039-0039).

11. Claim 79 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kanbe et al. in view of U.S. Patent No. 6,723,394 to Sirringhaus et al.

Kanbe discloses that the disclosed patterning method may be used with any arbitrary fluid body capable of being discharged from a fluid nozzle and having a sufficient surface

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tension (see columns 1 and 2). Kanbe further teaches that the patterning method is advantageous in permitting accurate control of the location and spread of the deposited material (see columns 1 and 2).

Kanbe fails to specifically teach deposition of a conductive material.

Sirringhaus discloses a patterning method wherein a conductive polymer is deposited using ink-jet techniques at selected locations (see column 6, lines 18-24).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the patterning method of Kanbe to the conductive polymer taught by Sirringhaus. The rationale is as follows: A person having ordinary skill in the art would have been motivated to use the patterning method of Kanbe with the conductive polymer of Sirringhaus, because Sirringhaus teaches that the conductive polymer may be deposited using a fluid nozzle in an ink jet type method, which makes the material compatible with the method of Kanbe, and because the patterning method of Kanbe allows for highly accurate positioning and patterning of the deposited material (see Kanbe, columns 1-4).

Response to Arguments

12. Applicant's arguments filed 9/1/05 are moot based on new grounds of rejection. The Examiner respectfully points out that claim 70 does not specifically require the liquid material to be disposed on a raised portion of a substrate, such that it is retained by liquid tension (which is consistent with the claimed invention), but rather, only requires an indent or a plurality of indents to be formed between the liquid portions. The Examiner further points out that the specification of the present application does not refer to the depressions formed in the secondary barrier cross

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sectional profile as 'indents', but rather, the specification refers to such as structure as being a single indent having a cross-sectional profile (see page 10). Therefore, the examiner is unclear as to whether the Applicant intends each low-point in the saw-tooth or castellated profile in the large indent is to be considered its own indent (for claim 70 and all claims dependent upon 70).

Conclusion


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer M. Dolan whose telephone number is (571) 272-1690. The examiner can normally be reached on Monday-Friday 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl W. Whitehead, Jr. can be reached on (571) 272-1702. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jennifer M. Dolan
Examiner
Art Unit 2813

jmd


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